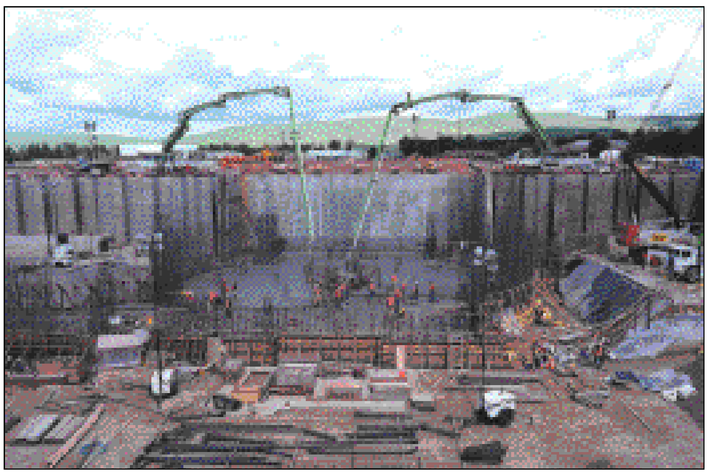
INERTIAL CONFINEMENT FUSION
Lawrence Livermore National Laboratory

# Monthly Highlights

*April 1998*

*UCRL-TB-128550-98-7*

**Final NIF Conventional Facility Construction Contract Awarded.** The last of the seven major Conventional Facility construction contracts, which total $157 million, was awarded at $58.4 million in late March to Nielson Dillingham; the notice to proceed was given April 13. Bidding and awarding of NIF construction contracts were divided into seven major (and one minor) bid packages covering all phases of construction. This final contract covers the portion of the facility that will house the target chamber, final optics, and laser switchyards. The photo below, available on a new Web page tracking NIF construction progress (http://lasers.llnl.gov/lasers/nif/building), shows an example of April activities.

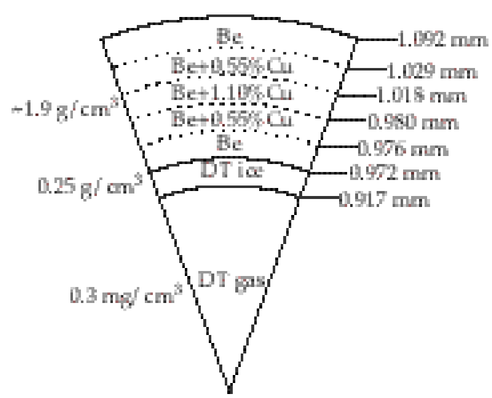


**Pumping concrete for the 6-foot-thick target bay mat slab.**

**NIF Laser Glass Production on Schedule.** The NIF Project is working with two laser-glass vendors, Schott Optical Glass and Hoya Corporation, to produce the laser glass used for the amplifier slabs. Initial results from the Schott full-scale melting run indicate that neodymium doping will succeed at full scale. The glass passed the NIF specifications for platinum inclusions and dissolved platinum, and also met the 1-µm absorption specification. Some of the glass will be fine-annealed over the next several weeks to evaluate homogeneity. The photo below shows a Schott NIF laser glass blank produced by continuous melting. Hoya's last demonstration meets most NIF specifications. All fabrication, inspection, and annealing ovens are included in one contract.

**Schott Optical Glass and Hoya Corporation are developing NIF laser glass. Pictured is a full-size laser glass blank from Schott's continuous melter.**

**NIF Ignition Capsule Design at Below-Nominal Drive Conditions.** We have designed a NIF ignition capsule to operate at both low-peak x-ray drive temperature (250 eV) and low total laser energy (900 kJ), simultaneously. This capsule ignites at these drive conditions, which are significantly less than the NIF point design (300 eV and 1.8 MJ) but is hydrodynamically less stable than the point design capsule. The 900-kJ capsule design, shown at right in schematic form, uses a beryllium (Be) ablator with a radially varying concentration of copper (Cu) to shield the fuel from radiation preheat and minimize hydrodynamic instability at the ice-Be interface. A 2D implosion simulation with 0.5-µm total rms multimode perturbation on the deuterium–tritium (DT) ice surface and a 15-nm total rms multimode perturbation on the ablator surface predicts ignition and propagated burn, yielding 3 MJ of fusion energy. Although these roughness specifications are beyond present capabilities, work is on going to improve ablator and ice surface smoothness.




**BeCu NIF capsule proposed for reduced laser drive. (Not to scale; copper dopant levels are atomic percent.)**

For comments about content of the *Monthly Highlights*, contact Don Correll (925) 422-6784.
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